REMARKS

The foregoing amendment to the specification and claims is intended to place the application in condition for allowance. More particularly, numbered paragraph [0022] of the specification, and Claims 16, 18, 20 and 25, were amended. In view of these amendments and the following reasoning for allowance, the applicants hereby respectfully request further examination and reconsideration of the subject application.

1. Interview Summary

The undersigned contacted the Examiner, J. Wu, and requested a telephonic interview to discuss a proposed response to the Office Action dated June 16, 2011. A draft of the proposed response was provided to the Examiner and the requested interview subsequently took place on September 6, 2011. The arguments for patentability provided in the aforementioned proposed response were discussed. No agreement as to the allowability of the claims was reached.

2. The Section 101 Rejection of Claims 25 and 28

Claims 25 and 28 were rejected in the above-identified Final Office Action under 35 USC §101 as being directed to non-statutory subject matter. The Examiner contends that the specification of the subject application can be construed such that the computer-readable storage medium recited in the rejected claims could be non-statutory subject matter. In response, the applicants have amended the claims to read "computer-readable storage medium, **which does not consist of a modulated data signal**".

It is believed that the addition of the limitation that the computer-readable storage medium does not consist of a modulated data signal precludes any interpretation that the storage medium constitutes non-statutory subject matter. Thus, as the claimed computer-readable storage medium clearly falls within a statutory class and that the claims are distinguished from non-statutory media defined in the specification, the

rejected claims are patentable under 35 USC §101. Accordingly, it is kindly requested that the rejection of Claims 25 and 28 be reconsidered. It is noted that similar changes were made to Claims 16, 18 and 20.

It is further noted that as the changes to the specification made in a previous amendment were deemed insufficient to overcome the 35 USC §101 rejections, the applicants have for the most part reversed these changes in the present amendment.

3. Rejection of Claims 1, 16-20 and 28 Under 35 USC §103(a)

Independent Claims 1 and 16 were rejected under 35 USC §103(a) as being unpatentable over Chow et al., U.S. Patent No. 6,771,966 in view of Ayyagari et al., U.S. Patent Application Publication No. 2002/0101822 (hereinafter Ayyagari), and further in view of Steer et al., U.S. Patent Application Publication No. 2004/0157613 (hereinafter Steer). It was contended in the Office Action that Chow teaches all the elements of the rejected claims with the exception of a contention-based MAC, and the adding and selecting of new nodes as potential access points. However, it is further contended these missing elements are respectively taught in Ayyagari and Steer. Thus, it was concluded that it would have been obvious to incorporate the teachings of Ayyagari and Steer into Chow to produce the applicants' claimed invention. In addition, independent Claims 17-20 and dependent Claim 28, were rejected under 35 USC §103(a) as being unpatentable over Chow in view of Ayyagari and Steer for the same reasons as Claims 1 and 16, and further in view of Layson et al., U.S. Patent No. 6,405,213 (hereinafter Layson). It was contended in the Office Action that the Chow-Ayyagari-Steer combination teaches all the elements of the rejected claims with the exception of iterating through a set of time intervals. However, it is further contended this element is taught in Layson. Thus, it was concluded that it would have been obvious to incorporate the teachings of Layson into the Chow-Ayyagari-Steer combination to produce the applicants' claimed invention. The applicants respectfully disagree with these contentions of obviousness.

The applicants claim among other things, "**determining placement locations of**

access points in a network...the network being **a multi-hop wireless mesh network...comprising nodes and links between the nodes...iterating through each access point in the set of prospective access point locations, in each iteration...selecting a test access point, from the set of prospective access point locations, to be added to a set of currently open access points; and computing node demands satisfied if the test access point is added to the set of currently open access points; selecting, as a new access point for the network, the test access point from the set of prospective access point locations having a maximum computed value of the node demands satisfied when opened together with access points in the set of currently open access points**; adding the selected new access point to the set of currently opened access points" (as exemplified in Claim 1). Independent Claim 16 contains similar language. It is noted that the language of Independent Claims 1 and 16 was amended to recite "**prospective access point locations**" to further emphasize that the access point locations being evaluated are at prospective locations and may not be chosen for inclusion in the currently open access points. The applicants also claim "**a set of potential access points to be opened...each access point in the set of potential access points having a potential placement location...iterating through the set of potential access points to be opened...computing a total of node demands satisfied by adding an access point from the set of potential access points to be opened, to a set of currently open access points...selecting the access point that results in the largest increase in the sum of satisfied node demands over all time intervals** (as exemplified in Claim 17). Independent Claims 18-20 contain similar language. For convenience, the foregoing bolded features will sometimes be referred to as the access point location determination features in the arguments to follow.

The Chow-Ayyagari-Steer and Chow-Ayyagari-Steer-Layson combinations do not teach the access point location determination features. None of the cited references even suggests a scheme to determine locations for access points in "a multi-hop wireless mesh network...comprising nodes and links between the nodes". Granted, the Examiner contends that Chow teaches the claimed access point location determination features.

However, this is not the case.

In a previous response to a similar rejection it was argued that the Chow reference teaches a scheme for optimizing the link topography between nodes with prescribed locations—not a scheme for establishing new nodes as claimed by the applicants. In Chow, the nodes must be either existing nodes with known locations, or planned nodes whose location has been decided upon and known, or potential nodes that may be activated in the future at a particular preselected location (see Col. 11, lines 1-3). Thus, regardless of the type of node, the location is known and does not change during the link determination process. In fact, the node locations (existing or otherwise) must be known in advance or the Chow scheme cannot identify the optimum link configurations. It is not stated in Chow how the existing or planned node locations where determined. It was described that potential node sites would be selected as follows:

> "The inclusion of potential future nodes according to the preferred embodiment provides for future growth. **Preferably the potential future node sites include all presently identifiable node sites meeting particular criteria**. For example, where the communication network is to provide high bandwidth data communication, such as shown and described in the above referenced patent application entitled COMMERCIAL NETWORK TOPOLOGIES UTILIZING POINT TO POINT RADIOS, all known locations with a service region meeting a selected threshold criteria, **such as any office building having six T1 subscribers located therein**, may be identified as potential future nodes. Of course other criteria may be utilized in addition to or in the alternative to the above. For example, **buildings of particular sizes, companies having particular numbers of employees, businesses conducting particular types of business, locations of expected future growth (although currently not meeting a selected criteria or even having any building or infrastructure located thereon), and the like may be utilized as criteria to identify potential future node sites**". (Col. 11, lines 12-30) (*emphasis added*)

Thus, the selection of potential node locations is based on the geography, or the number or type of potential users, of the site. **The potential node locations are clearly not selected using the claimed access point location determination features**.

However, in the above-identified Final Office Action, the Examiner states just the opposite. The Examiner contends "[t]he locations are chosen during this process [the Chow link optimization process], and they are not known in advance. In support of this contention, the Examiner first cites Col. 5, lines 42-49 of Chow which reads:

> "the identified group of network node sites analyzed according to the present invention includes at least two categories for grouping of network node sites; installed node sites and future node sites. **By <u>including</u> not only the installed node sites in the link analysis but also the future node sites, the links which are currently established may be adapted to easily accept the addition of links of the future node sites as demand increases**". (*emphasis added*)

However, this quotation indicates that future sites are included in the link analysis—not determined by it. This embodiment of Chow includes the anticipated locations of future nodes in order to find an optimum link topography that allows the future sites to come on-line without interference with the existing sites and without having to re-configure the links of existing sites. This does not indicate that the link optimization analysis determines the locations of these future sites. Quite to the contrary, it indicates the locations of the future sites must be known ahead of time in order to perform the link optimization analysis. This is clearly shown in the above-quoted section of Chow where it is stated that :

> "**Preferably the potential future node sites <u>include all presently identifiable node sites</u> meeting particular criteria**". (Col. 11, lines 13-15) (*emphasis added*)

The Examiner also states that the applicants' "assertions are incorrect because the locations of nodes determine the characteristics of links between the nodes", and that "Chow teaches iterating the potential access point locations until link characteristics meet the desired criteria", and that Chow states "to identify the future node site" at Col. 5, lines 42-49. While it is clear from Chow that the locations of the nodes does determine the characteristics of links between the nodes, Chow does not iterate access point locations. Chow iterates through various link configurations among nodes whose locations are prescribed and which do not change between iterations in order to find the optimum link configuration. This is shown in Chow at Col. 9, lines 47-67 which reads:

> "Currently **when deploying multiple links**, a highly skilled engineer performs **a manual process to provide the best set of radio links or radio topology** **once the nodes and radio sites have been identified**. In the first step, the designer enters radio site location into a RF tool such as PATHLOSS, EDX, etc. These RF tools identify the RF properties of the radio site locations. **Next, the designer, based on their experience, places the radio links, the links which join the radio sites, into the system. Radio links are selected to minimize the interference between other radio links**. Next, RF tools performance computations are run which determine the performance of each of the radio links and the mutual interference levels between radio links. **Once the performance and interference are identified the engineer decides which links are acceptable and which links should be eliminated from further consideration.** Once the unacceptable links and other links selected by the engineer are eliminated, **the RF tools performance computation are run again to determine the overall characteristics of the radio topology. This iterative process is repeated until the engineer is satisfied with the layout**". (*emphasis added*)

Thus, the cited statement in Chow refers to an engineer picking, evaluating and eliminating unacceptable links between the node locations. It has nothing to do with iterating through potential access point locations, as claimed by the applicants. In fact, it is clearly stated

that the link selection iteration process in Chow does not start until "the nodes and radio sites have been identified"—a process which does not involve the claimed access point location determination features as shown above.

It is also noted that Chow does not state "to identify the future node site" at Col. 5, lines 42-49, as contended by the Examiner. Rather, it is stated that:

> "**the identified group of network node sites analyzed** according to the present invention includes at least two categories for grouping of network node sites; installed node sites and future node sites".

As can be seen, the node sites (installed and future) are part of a group of network sites that had been already **identified**. Nothing is said about identifying future node sites during the disclosed link optimization process. The identification of future node sites prior to performing the Chow link optimization procedure is described elsewhere in Chow—namely in the above-quoted section found at Col. 11, lines 12-30 which shows the future node locations are identified based on the geography, or the number or type of potential users, of the site. They are not selected using the claimed access point location determination features.

The Examiner further states that the applicants' "assertion is incorrect because Chow teaches that the locations of new/future nodes may be selected in order to make the link characteristics meet the desired criterions, as explained in Col. 5, lines 42-49. However, this section of Chow, as well as the rest of the reference, teaches just the opposite. The link characteristics are made to meet the desired criteria based on the prescribed locations of the existing or future nodes—not the other way around. This is clearly stated in the cited section of Chow which reads:

> "**the identified group of network node sites** analyzed according to the present invention includes at least two categories for grouping of network node sites; **installed node sites and future node sites**. By **including not**

> **only the installed node sites in the link analysis but also the future node sites**, the **links** which are currently established may be adapted to easily accept the addition of **links** of the future node sites as demand increases". (*emphasis added*)

Chow's scheme uses pre-identified node site locations (existing and future) to analyze the links between them and to find a link configuration that takes into consideration the impact of adding links when nodes at the prescribed future node site locations come on-line. These node site locations must be known before the analysis begins, as stated in Col. 9, lines 47-50 which reads:

> "Currently when deploying multiple links, a highly skilled engineer performs a manual process to provide the best set of radio links or radio topology **once the nodes and radio sites have been identified**. (*emphasis added*)

Still further, the Examiner contends in the Final Office Action that the claimed "selecting, as a new access point for the network, the test access point from the set of potential access points having a maximum computed value of the node demands satisfied when opened together with access points in the set of currently open access points" is taught by the Chow link selection (Col. 10, line 64). However, selecting links between nodes in not the same as selecting an access point. A link is not an access point. Granted, the examiner equates an access point to a node. Even if for argument sake this is assumed to be the case, the applicants respectfully submit that identifying nodes and identifying links between the nodes are two distinct and separate processes and cannot be considered equivalent. By definition, nodes and links are different. Nodes are points in a network where two paths intersect. A node can be realized physically in the form of a terminal, building, computer, PDA, cell phone, or router among several possible computing devices. In contrast, a link cannot. A link is what connects two nodes of a network. In view of the foregoing, the Office Action's assertion of equivalency between adding links and adding nodes is incorrect.

The Examiner additionally asserts in the Final Office Action that the statement in Chow at Col. 9, lines 64-66 reading "the RF tools performance computation are run again to determine the overall characteristics of the radio topology" suggests the claimed access point location determination features by contending the radio topology includes access points. However, the radio topology referred to in Chow is restricted to link configuration among nodes having a fixed location. It does not include a reconfiguration of the node locations. This is made evident by the statement in Chow at Col. 9, lines 47-50 which read:

> "Currently **when deploying multiple links**, a highly skilled engineer performs **a manual process to provide the best set of radio links or radio topology** **once the nodes and radio sites have been identified**.

Clearly, this statement shows that the locations of the nodes must be known before the engineer performs a process of providing the best radio topology. If the determination of the node locations was part of this process, they would not need to be known beforehand. Nothing in Chow teaches or suggests its link optimization scheme results in node locations different from those employed to perform the optimization. The node locations simply do not change. Clearly, if the node locations do not change, Chow cannot be said to teach the claimed access point location determination features.

In order to deem the applicant's claimed invention unpatentable under 35 USC 103, a prima facie showing of obviousness must be made. To make a prima facie showing of obviousness, all of the claimed elements of an applicant's invention must be considered, especially when they are missing from the prior art. If a claimed element is not taught in the prior art and has advantages not appreciated by the prior art, then no prima facie case of obviousness exists. The Federal Circuit court has stated that it was error not to distinguish claims over a combination of prior art references where a material limitation in the claimed system and its purpose was not taught therein (*In Re Fine*, 837 F.2d 107, 5 USPQ2d 1596 (Fed. Cir. 1988)).

In this case, the cited combination does not teach the claimed access point

location determination features. Accordingly, no prima facie case of obviousness can be established in accordance with the holding of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected claims are patentable under 35 USC 103(a) over Chow in view of Ayyagari and Steer in the case of Claims 1 and 16, and over Chow in view of Ayyagari, Steer and Layson in the case of Claims 17-20 and 28. It is, therefore, respectfully requested that these claims be allowed based on the previously-quoted non-obvious claim language.

4. Rejection of Claims 3-8 and 10-15 Under 35 USC §103(a)

Claims 3 and 10 were rejected under 35 USC §103(a) as being unpatentable over Chow in view of Ayyagari and Steer, and in further view of Bush et al., U.S. Patent Application Publication No. 2004/0250128 (hereinafter Bush). Claims 4, 7-8, 11 and 14-15 were rejected under 35 USC §103(a) as being unpatentable over Chow in view of Ayyagari and Steer, and in further view of Matsunaga et al., U.S. Patent No. 5,440,675 (hereinafter Matsunaga). And finally, Claims 5, 6, 12 and 13 were rejected under 35 USC §103(a) as being unpatentable over Chow in view of Ayyagari and Steer, and in further view of McGlade et al., U.S. Patent No. 6,411,598. It was contended in the Office Action that the Chow-Ayyagari-Steer combination teaches all the elements of the rejected claims with the exception of a various features alleged to be taught in Bush, Matsunaga and McGlade. Thus, it was concluded that it would have been obvious to incorporate the teachings of Bush, Matsunaga and McGlade into the Chow-Ayyagari-Steer combination to produce the applicants' claimed invention. The applicants respectfully disagree with these contentions of obviousness.

The applicants claim among other things, "A method for **determining placement locations of access points** in a network...the network being **a multi-hop wireless mesh network...comprising nodes and links between the nodes...iterating through each access point in the set of potential access points to be opened, in each iteration...selecting a test access point, from the set of potential access points to be opened, to be added to a set of currently open access points; and computing node**

demands satisfied if the test access point is added to the set of currently open access points; selecting, as a new access point for the network, the test access point from the set of potential access points having a maximum computed value of the node demands satisfied when opened together with access points in the set of currently open access points; adding the selected new access point to the set of currently opened access points" (as exemplified in Claim 1). Independent Claim 16 contains similar language. For convenience, the foregoing bolded features will sometimes be referred to as the access point location determination features in the arguments to follow.

The Chow-Ayyagari-Steer-Bush, Chow-Ayyagari-Steer-Matsunaga and Chow-Ayyagari-Steer-McGlade combinations do not teach the access point location determination features. None of the cited references even suggests a scheme to determine locations for access points in "a multi-hop wireless mesh network...comprising nodes and links between the nodes". Granted, the Examiner contends that Chow teaches the claimed access point location determination features. However, as shown previously this is not the case. Rather, the Chow reference teaches a scheme for optimizing the link topography between nodes with prescribed locations. These nodes can be existing nodes with known locations, or planned nodes whose location has been decided upon and known, or potential nodes that may be activated in the future at a particular location. However, regardless of the type of node, the location is known and does not change during the link determination process. In fact, the node locations (existing or otherwise) must be known in advance or the Chow scheme cannot identify the optimum link configurations.

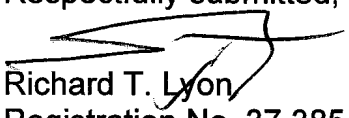
Accordingly, the cited combinations do not teach the claimed access point location determination features. As such, no prima facie case of obviousness can be established in accordance with the holding of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected claims are patentable under 35 USC 103(a) over Chow in view of Ayyagari and Steer, and further in view of Bush in the case of Claims 3 and 10, over Chow in view of Ayyagari, Steer and Matsunaga in the case of Claims 4, 7-8, 11 and 14-15 and over Chow in view of Ayyagari, Steer and McGlade in

the case of Claims 5, 6, 12 and 13. It is, therefore, respectfully requested that these claims be allowed based on the previously-quoted non-obvious claim language.

5. Summary

The applicants gratefully acknowledge the allowance of Claims 23 and 24. Additionally, in view of the amendments and arguments set forth above, the applicants respectfully submit that the remaining claims are in condition for allowance as they are patentable subject matter and not obvious over the cited art. Accordingly, it is respectfully requested that the rejection of Claims 1, 3-8, 10-20, 23-25 and 28 be reconsidered. In addition, allowance of all these claims at an early date is courteously solicited.

Respectfully submitted,



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